Research Article

Bridging Organizational and Multilevel Networks in Adaptive Governance of the Preservation Area of Tanjung Binerean Wildlife Corridor, South Bolaang Mongondow Regency

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Abstract.

Tanjung Binerean is home to Sulawesi's endemic maleo bird and other wildlife. Management and protection of this area is needed to ensure that the richness of animals in the wildlife preservation corridor is maintained. This research aims to see how bridging organizational and multilevel networks in the governance of Tanjung Binerean wildlife corridor preservation in South Bolaang Mongondow Regency can be implemented properly. It uses a qualitative approach and collects data through observation, in-depth interviews, and documentation. Data sources consist of primary and secondary data, while data analysis is carried out using interactive methods. The informants in this study were stakeholders and other parties directly involved in the implementation of preservation of the Tanjung Binerean wildlife corridor. The results of this study show that the government of South Bolaang Mongondow Regency has the main role in the management of the Tanjung Binerean Wildlife Corridor, especially since it is the driving force of collaboration forums with various parties both internal to the government and external parties at the local, national, and international levels. However, despite the active implementation of the forum with various elements of community, government, private sector, and organizations, the forum still cannot address problems such as the high rate of deforestation that threatens animal and plant habitats, especially in this corridor.

Keywords: bridging organization, multilevel networks, adaptive governance, wildlife corridor

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1. Introduction

Biodiversity conservation in tropical regions faces increasing challenges from habitat fragmentation, land-use change, and climate variability. Wildlife corridors represent critical landscape elements that maintain connectivity between otherwise isolated habitat patches, allowing genetic exchange and essential movement for species survival. However, effective governance of these corridors remains challenging, particularly in

developing regions where multiple stakeholders with divergent interests interact across jurisdictional boundaries.

The Tanjung Binerean wildlife corridor in South Bolaang Mongondow Regency, North Sulawesi, Indonesia, represents a critical habitat for the Maleo bird (Macrocephalon maleo), an endemic and critically endangered species according to the IUCN Red List of Threatened Species. This corridor connects the inland habitat in Bogani Nani Wartabone National Park with coastal nesting grounds, forming an essential ecological linkage for the species' survival. The Maleo's distinctive reproductive behavior makes it particularly vulnerable to habitat disturbance, as it relies on geothermal heat or solar radiation at coastal sites for egg incubation rather than parental care [1].

The urgency of conservation in the Tanjung Binerean corridor is underscored by alarming quantitative indicators. Recent satellite imagery analysis reveals a 12.3% reduction in forest cover between 2018-2023, with approximately 157 hectares lost annually to agricultural expansion and illegal logging. The corridor width has narrowed from an average of 3.2 km to just 1.8 km in critical sections, severely compromising wildlife movement. Maleo population surveys indicate a 43% decline over the past decade, from an estimated 230 breeding pairs in 2013 to only 131 pairs in 2023. Land-use conversion data shows 27% of the corridor's buffer zone has been transformed into coconut plantations and settlements, while illegal encroachment increases at 5.7% annually. These metrics highlight the time-sensitive nature of implementing effective adaptive governance mechanisms before critical ecological thresholds are crossed.

Protecting such corridors requires governance arrangements that transcend traditional hierarchical management structures. Adaptive governance has emerged as a promising framework for managing complex social-ecological systems through flexible, collaborative mechanisms that engage diverse stakeholders [2], [3]. Within this framework, two key elements have gained prominence: bridging organizations that connect different governance levels and sectors, and multilevel networks that facilitate knowledge exchange and coordinated action across scales [4].

The governance challenges in Tanjung Binerean exemplify broader issues in conservation management across Indonesia. Following decentralization reforms under Law No. 23/2014 on Regional Government, conservation authority has been distributed across multiple government levels, creating jurisdictional ambiguities that complicate management efforts. This situation is further complicated by the presence of different land-use designations within the corridor area, including production forests, protected

forests, and other land uses (APL) where local communities maintain customary claims [5].

Despite these challenges, the South Bolaang Mongondow government has pioneered innovative governance arrangements, including the establishment of a collaborative forum through Regent's Decree No. 289/2019 and Regional Regulation No. 2/2021 on Wildlife Refuge Area Management. These initiatives signal a shift toward more adaptive approaches to conservation governance, but their effectiveness in practice remains understudied.

Recent scholarship suggests that adaptive governance emerges through the interaction of multiple variables, including polycentric institutions, social learning mechanisms, bridging organizations, and multilevel networks [6]. Understanding how these elements operate in specific contexts is crucial for developing effective conservation governance models adaptable to diverse settings . The Tanjung Binerean case provides a valuable opportunity to examine the practical implementation of these theoretical constructs in a high-biodiversity, resource-constrained setting.

This research addresses a significant gap in the literature by examining how bridging organizations and multilevel networks function within adaptive governance frameworks in the context of wildlife corridor management in Indonesia. By analyzing institutional arrangements, power dynamics, and coordination mechanisms in Tanjung Binerean, this study contributes to both theoretical understanding of adaptive governance and practical knowledge for conservation practices navigating complex social-ecological systems in tropical regions [7], [8].

The theoretical foundation for analyzing wildlife corridor governance draws from several interconnected bodies of literature, particularly adaptive governance, bridging organizations, and multilevel networks, which collectively provide a robust framework for understanding complex social-ecological systems management.

Adaptive governance emerged as a response to the limitations of traditional top-down management approaches in addressing complex, cross-scale environmental challenges. Defined as "a range of interactions between actors, networks, organizations, and emerging institutions in pursuit of a desired state for social-ecological systems"[9], [10], adaptive governance emphasizes flexibility, experimentation, and collaborative decision-making. [11]identified key principles of adaptive governance, including polycentricity, public participation, and institutional variety. Recent research has extended

this framework to incorporate elements of social learning, knowledge co-production, and adaptive capacity [12].

In wildlife conservation contexts, adaptive governance has shown promise in addressing challenges that span ecological, jurisdictional, and temporal scales. Scarlett and McKinney (2016) demonstrated how adaptive governance arrangements facilitated landscape-scale conservation planning across public-private boundaries in the Northern Rockies. Similarly, Wyborn and Bixler [4]analyzed how adaptive co-governance emerged in large-scale connectivity conservation initiatives in Australia and North America, emphasizing the importance of collaborative networks and shared vision development.

Within adaptive governance frameworks, bridging organizations play a crucial role in connecting diverse stakeholders across scales and sectors.[10] defined bridging organizations as entities that facilitate coordination between different levels of governance and provide forums for knowledge exchange, trust-building, and conflict resolution. [13]further elaborated on the functions of bridging organizations, highlighting their roles in reducing transaction costs, building social capital, and mediating power asymmetries in environmental governance.

Empirical studies have documented the effectiveness of bridging organizations in various conservation contexts. [2]analyzed how bridging organizations facilitated cross-scale linkages in community-based conservation programs in Canada. [14] examined how the emergence of bridging organizations contributed to successful ecosystem management transitions in Sweden. In Indonesia specifically,[15] demonstrated how bridging organizations facilitated REDD+ implementation by connecting international donors, national policymakers, and local communities.

Complementing bridging organizations, multilevel networks provide the structural foundation for information flow and coordinated action across governance scales. Multilevel networks differ from traditional hierarchical structures by emphasizing horizontal and vertical linkages simultaneously. [16]distinguished between Type I (jurisdictional) and Type II (functional) multilevel governance arrangements, with the latter proving particularly relevant for wildlife corridor management that transcends administrative boundaries.

Recent scholarship has begun examining how multilevel networks function in conservation governance. [2]analyzed network structures in Australian natural resource management, finding that centralized networks facilitated coordination while distributed

networks enhanced innovation. [17]demonstrated how network density and centralization influence conservation outcomes in subtropical Australia. Building on these insights,.

In Indonesia, post-decentralization conservation governance has created both challenges and opportunities for multilevel network development. [12]examined how forest governance networks evolved following decentralization reforms, noting persistent coordination challenges across scales. [18]analyzed power dynamics within forestry sector networks, highlighting how competing actor networks influence policy outcomes. Despite these challenges, [19]documented emerging cross-scale collaboration in community-based forest management initiatives.

The integration of these theoretical perspectives provides a robust framework for analyzing wildlife corridor governance. [20], [21] demonstrated how bridging organizations and multilevel networks interact to create effective adaptive governance arrangements in transboundary conservation areas of Southern Africa. Similarly,[22] proposed a diagnostic approach that examines how legal frameworks, institutional arrangements, and adaptive capacity together influence governance resilience.

However, significant gaps remain in understanding how these theoretical constructs operate in specific cultural, political, and ecological contexts, particularly in high-biodiversity regions facing acute development pressures. This study addresses these gaps by examining the interplay between bridging organizations and multilevel networks in the governance of the Tanjung Binerean wildlife corridor, contributing both empirical insights and theoretical refinements to the adaptive governance literature.

2. Methods

This research employed a qualitative case study approach to examine the governance dynamics of the Tanjung Binerean wildlife corridor in South Bolaang Mongondow Regency. Case study methodology was selected for its capacity to provide in-depth understanding of complex social phenomena within their real-world contexts (Yin, 2018), making it particularly suitable for investigating governance arrangements that involve multiple stakeholders and institutional levels. This research employed an exploratory-analytical design examining bridging organizations and multilevel networks within adaptive governance frameworks for wildlife corridor management, using data triangulation through complementary methods including semi-structured interviews with

27 key stakeholders from multiple governance levels, participant observation during four collaborative forums and field monitoring activities, and focus group discussions with representatives from four corridor-adjacent villages (Mataindo, Mataindo Utara, Torosik, and Adow), supplemented by extensive document analysis of regional regulations, decrees, documents planning, and meeting minutes; the collected data underwent rigorous thematic analysis through iterative coding processes (open, axial, and selective) using NVivo 12 software, with validity ensured through triangulation, member checking, and peer debriefing, while ethical protocols maintained participant confidentiality; the analytical framework specifically targeted structural characteristics and functional effectiveness of bridging entities and networks, examining their contributions to adaptive capacity, polycentric governance mechanisms, social learning processes, and meaningful public participation in corridor governance, providing a contextually sensitive approach as advocated by Flyvbjerg (2006) for studying complex governance systems.

3. Results and Discussion

3.1. Result

A. Bridging Organization in Tanjung Binerean Wildlife Corridor Governance

1. Cross-Sector and Scale Coordination Function

The district government carries out a coordination function that connects various parties from various sectors and scales of government. Coordination is carried out formally through the Preservation Area Management Collaboration Forum which was formed based on Regent Decree Number 289 of 2019. As expressed by the Head of the Environmental Service of South Bolaang Mongondow Regency:

"Our main role is to connect all parties, from village communities to ministries, and facilitate them to work together on one platform. We act as a liaison between BKSDA, KPH, communities, conservation NGOs, and the private sector. Without our coordination, it is very difficult to integrate various interests and existing programs." (Interview, March 12, 2023)

The forum brought together stakeholders with various backgrounds and interests, including the North Sulawesi BKSDA, KPH II of the North Sulawesi Provincial Forestry Service, WCS Indonesia Program, local communities, and companies such as PT. Cargill Amurang and PT. J-Resources Bolaang Mongondow.

2. Dialogue Facilitation and Conflict Management Function

The district government acts as a facilitator of dialogue between various stakeholders, especially in reconciling potential conflicts between conservation interests and the economic interests of the community. The Chair of the Tanjung Binerean Wildlife Corridor Management Collaboration Forum stated:

"Initially there was resistance from the community because they were worried about losing access to agricultural land. The district government facilitated a dialogue between the BKSDA, the community, and other parties to find a solution that could accommodate conservation while ensuring the sustainability of the local economy. As a result, we agreed on zoning that allows for sustainable agricultural activities in the buffer zone while protecting critical routes used by animals."

In this facilitation process, the district government developed an adaptive conflict resolution mechanism, involving traditional leaders, village governments, and other related parties.

3. Function of Policy and Knowledge Translator

District governments act as translators of national and provincial policies into local contexts, and help translate scientific knowledge into implementable management practices.

The Head of Bappeda for South Bolaang Mongondow Regency explained:

"We have to bridge national conservation policies, such as Law No. 32 of 2024, with the realities and needs of local communities. We also translate research results from institutions such as WCS into programs that can be understood and implemented by village communities. This is important because communities are often confused by technical conservation terms." (Interview, March 20, 2023)

This translation function is also seen in the development of educational and socialization materials that are adapted to the local context, including the use of language and examples that are relevant to the local community.

4. Resource Mobilization Function

Despite facing budget constraints, the district government has succeeded in carrying out the function of mobilizing resources from various parties to support the management of wildlife corridors.

The Head of the North Sulawesi BKSDA gave his views:

"The Bolsel Regency Government is very active in seeking alternative funding and technical support. They have succeeded in garnering support from the Ministry of Environment and Forestry, WCS Indonesia, and companies such as PT. Cargill through

CSR. Although they cannot allocate a special budget due to limited authority, they provide physical facilities such as a secretariat office worth more than 1.5 billion rupiah, which serves as a coordination center for all programs." (Interview, April 5, 2023)

This resource mobilization includes program funding, technical support, capacity building, and supporting infrastructure.

B. Effectiveness of Bridging Organization in Integrating Interests and Knowledge

Table 1 shows the results of the analysis of the effectiveness of the South Bolaang Mongondow Regency Government as a bridging organization based on five main indicators:

Table 1: Effectiveness of the Role of Bridging Organizations in the South Bolaang Mongondow Regency Government.

Indicator	Scale	Analysis Result Notes
Ability to connect actors across scales	4	Successfully facilitated relationships from village level to international level
Ability to facilitate dialogue	4	Collaboration forums function effectively as a platform for multi-party dialogue.
Resource mobilization capabilities	3	Limited by authority, but creative in seeking alternative funding
Knowledge translation capability	3	There have been significant efforts but there are still gaps in understanding.
Conflict management skills	3	Successfully resolved the main conflict, but some issues remain unresolved

The results of the analysis show that the highest effectiveness lies in the ability to connect actors and facilitate dialogue, while the main challenges lie in limited authority and budget.

C. Challenges and Constraints in Implementing the Role of Bridging Organization

Despite showing quite high effectiveness, the South Bolaang Mongondow Regency Government faces various challenges in carrying out its role as a bridging organization. Based on the research results, these challenges include:

1. Limited Authority and Budget

Limited authority is a major challenge, as regulated in Law No. 23 of 2014 concerning Regional Government which transfers most of the authority for conservation management to the central and provincial levels. The Regional Secretary of South Bolaang Mongondow Regency explained:

"We face a dilemma. On the one hand, this area is in our territory and we are responsible for the welfare of the community and environmental sustainability. On the other hand, we do not have formal authority for conservation management and cannot

allocate a special budget because there is no appropriate nomenclature in the APBD structure. This is a major obstacle in developing sustainable programs." (Interview, April 8, 2023)

To address these challenges, the district government developed creative approaches, such as integrating conservation activities into community empowerment programs and seeking funding support from external partners.

2. Capacity and Knowledge Gaps

Another challenge is the existence of capacity and knowledge gaps at various levels of government and society. The WCS Indonesia Program Coordinator in North Sulawesi explained:

"There is a significant capacity gap, especially in terms of technical understanding of biodiversity conservation. District governments often struggle to translate scientific concepts into language that is easily understood by the community. In addition, personnel turnover in government agencies often results in a loss of institutional knowledge." (Interview, April 10, 2023)

Efforts to address these challenges are carried out through ongoing capacity building programs, including training, workshops and comparative studies.

3. Political Dynamics and Changing Priorities

Local political dynamics and changing development priorities also influence the effectiveness of the role of bridging organizations. A community leader from Mataindo Village said:

"Every time there is a change of leadership, priorities often change. What was previously agreed upon is sometimes not continued. This leaves the community confused and hesitant to participate in long-term conservation programs." (Interview, April 12, 2023)

To address these challenges, collaborative forums seek to institutionalize agreements in the form of formal documents, such as regional regulations and long-term work plans, that bind the parties regardless of changes in leadership.

B. Multilevel Networks in the Governance of the Tanjung Binerean Wildlife Corridor

A. Structure and Dynamics of Multilevel Networks

This study identifies the multilevel network structure formed in the governance of Tanjung Binerean Wildlife Corridor. This network includes three main levels: local, national, and global/international.

1. Local Level Network

At the local level, the network consists of district governments, village governments, local communities (including farmer and fisher groups), traditional leaders, and local business actors. Interactions at this level focus on direct management of the area, including monitoring, habitat rehabilitation, and development of alternative livelihoods. The Head of Mataindo Village explained:

"We have a forest monitoring group that coordinates directly with the district government and BKSDA. Every month we conduct joint patrols to monitor forest and wildlife conditions. We also meet regularly to discuss issues faced by the community regarding access to land and natural resources." (Interview, April 15, 2023)

This local network has a high intensity of interaction with regular meetings and intensive informal communication.

2. National Level Network

At the national level, the network involves relevant ministries (MoEF, Ministry of Agriculture), provincial government agencies (Provincial Forestry Service, Provincial Bappeda), and national NGOs such as the WCS Indonesia Program. Interactions at this level focus on policy formulation, technical support, and resource allocation. Head of KPH II, North Sulawesi Provincial Forestry Service stated:

"We work together with BKSDA and the Bolsel Regency Government in managing forest areas around the corridor. We also coordinate with the Ministry of Environment and Forestry to align forest management and wildlife conservation policies. The challenge is to synchronize various programs from the central level with needs in the field." (Interview, April 20, 2023)

Interactions at the national level are more formal and structured, with regular meetings and systematic reporting mechanisms.

3. Global/International Level Network

At the global level, the network involves international organizations such as NAM CSSTC, the International Coconut Community (ICC), and multinational companies such as PT. Cargill. Interactions at this level focus on financial support, knowledge transfer, and global market access. The CSSTC NAM Program Coordinator for North Sulawesi explains:

"We help connect coconut farmers around the Tanjung Binerean corridor with international markets through a sustainable certification program. We also facilitate knowledge exchange between southern countries on best practices in managing conservation areas adjacent to agricultural areas." (Interview, April 25, 2023)

Interactions at the global level tend to be more structured with a focus on specific programs and time frames.

C. Interaction Patterns in Multilevel Networks

1. Flow of Information and Knowledge

Research shows that the flow of information and knowledge in multilevel networks tends to be two-way, although with varying intensity. Information on policies and technical standards generally flows from the national and global levels to the local level, while information on field conditions and local knowledge flows from the local level to the national and global levels. A staff member of the North Sulawesi BKSDA explained:

"We get information about animal movements and threats from local people who do patrols. We report this information to the center and it becomes the basis for policy formulation. Conversely, we also convey information from the center about the latest standards and regulations to the district government and the community." (Interview, April 28, 2023)

Although the flow of information is two-way, research has found barriers in some communication channels, especially from the local to the national and global levels.

2. Distribution of Power and Decision Making

Analysis of the distribution of power in the network shows an imbalance, where actors at the national and global levels have greater influence in strategic decision-making, while local actors play a greater role in implementation. Table 2 shows the results of the analysis of power distribution based on decision type:

Table 2: Distribution of Power in Decision Making.

Types of Decisions	Local Level	National Level	Global Level
Establishment of regulations and policies	✓✓	✓✓✓✓	✓
Budget and resource allocation	✓	✓✓✓	✓✓✓
Technical planning	✓✓	✓✓✓	✓✓
Implementation and monitoring	✓✓✓✓	✓✓	✓
Program evaluation	✓✓	✓✓✓	✓✓

A community leader from Adow Village expressed his perspective:

"We often feel like we are just implementing programs that have been decided from above. Even though there are consultation forums, the final decisions are still predominantly influenced by the central government and donors. We want to be more involved in decision-making that affects our lives." (Interview, May 2, 2023)

However, the study also found that there were efforts to strengthen the voice of local communities through deliberative forums such as village and sub-district level development planning meetings (Musrenbang).

3. Coordination and Collaboration Between Levels

Coordination and collaboration between levels in the network show a complex pattern. On the one hand, there are formal mechanisms such as collaboration forums that facilitate coordination. On the other hand, there are still overlaps and gaps that need to be addressed. The Head of Planning for the Regency Environmental Service explained:

"The main challenge in coordination is aligning different schedules and planning cycles. Ministries, local governments, and international donors have different budget and planning cycles. This often leads to program inconsistencies. We try to address this by developing a long-term roadmap that serves as a common reference, regardless of each budget cycle." (Interview, May 5, 2023)

Efforts to strengthen coordination are carried out through several mechanisms, including:

1. Regular coordination meetings are held every three months.

2. Shared information system for program monitoring and evaluation

3. Joint action plans are prepared and reviewed periodically.

The Role of Multilevel Networks in Enhancing Adaptive Capacity

This study also analyzes how multilevel networks contribute to adaptive capacity in the governance of Tanjung Binerean Wildlife Corridor. The results of the analysis show several important contributions:

a. Increasing Diversity of Resources and Approaches

Multilevel networks allow access to a variety of resources and approaches, which enhances the system's ability to adapt to challenges. For example, when there is a decrease in central government funding, funding from the private sector and international agencies can help continue critical programs.

PT. Cargill Amurang Program Manager explained:

"Through our CSR program, we support coconut farmers around the corridor to adopt sustainable farming practices. When government funding is limited, we can fill the gap by providing training and technical assistance. This helps maintain the sustainability of the program despite fluctuations in government funding." (Interview, May 8, 2023)

The diversity of approaches is also evident in the combination of traditional knowledge of local communities with modern technologies facilitated by international partners.

b. Increasing Learning and Innovation Capacity

Multilevel networks facilitate cross-scale learning and innovation in management approaches. This learning occurs through the exchange of experiences, training, and adaptive trial and error processes. Head of the WCS Indonesia Conservation Unit explained:

"We introduced the SMART Patrol method that combines local knowledge with GPS technology and mobile applications. Local communities then adapted this approach to their conditions and needs. The result is a patrol system that is more effective and locally relevant. This is a good example of how cross-scale learning leads to innovation." (Interview, May 10, 2023)

This learning capacity is strengthened through formal mechanisms such as experience-sharing workshops and digital platforms for knowledge sharing.

c. Increased Resistance to Change

Multilevel networks also contribute to increasing the resilience of governance systems to various forms of change, including policy changes, personnel turnover, and socio-ecological dynamics. The Head of Torosik Village explained:

"Previously, when there was a change of officials in the district or province, conservation programs often stopped. Now, with a network involving many parties, including NGOs and communities, the program continues even though there is a change of personnel. This network provides continuity which is very important." (Interview, May 12, 2023)

This resilience is also seen in the system's ability to respond to changing ecological conditions, such as when animal migration routes change due to habitat disturbance.

D. Challenges in Developing and Managing Multilevel Networks

Despite showing various positive contributions, the development and management of tiered networks also faces several significant challenges:

a. Coordination Complexity and Transaction Costs

Coordination complexity and high transaction costs are major challenges in managing multilevel networks. Coordination between multiple actors with different timeframes, priorities, and procedures requires significant time and resources. The Secretary of the Collaboration Forum said:

"Coordinating meetings involving ministry officials, local governments, NGOs, and communities is very challenging. Their schedules are difficult to match, not to mention differences in perceptions and priorities. Each meeting requires intensive preparation, including lobbying and informal communication beforehand to ensure the attendance of all key parties." (Interview, May 15, 2023)

To address these challenges, the collaborative forum developed an annual meeting schedule agreed upon at the beginning of the year, and utilized technology such as video conferencing for meetings that did not require the physical presence of all parties.

b. Asymmetry of Power and Representation

Power asymmetries and challenges in ensuring equal representation are important issues in multilevel networks. Actors with greater resources and authority tend to have greater influence in decision-making. An activist from a local civil society organization explained:

"In official forums, the voices of indigenous peoples and marginalized groups are often not heard. They are physically present but do not have the capacity to effectively voice their interests. We try to accompany them, but there is still a big gap in terms of influence compared to the government or big companies." (Interview, May 18, 2023)

Efforts to address these challenges include increasing the capacity of local communities to participate effectively in decision-making forums, as well as developing specific mechanisms to ensure that the voices of marginalized groups are heard.

c. Network Sustainability

Long-term network sustainability is also a challenge, especially when there are policy changes, key personnel changes, or funding reductions. The BKSDA Program Coordinator explained:

"The network is highly dependent on the personal commitment of a few key figures in the district and provincial governments. When they are transferred or retire, there is often a decline in the intensity and quality of coordination. The challenge is how to institutionalize the network so that it is not dependent on certain individuals." (Interview, May 20, 2023)

To address these challenges, efforts are made to institutionalize networks through formal regulations, standard operating procedures, and good documentation systems to ensure continuity of knowledge and relationships.

E. Integration of Bridging Organization and Multilevel Networks in Adaptive Governance

Synergy between the Role of Bridging Organization and Multilevel Networks

This study reveals the synergy between the role of the South Bolaang Mongondow Regency Government as a bridging organization and the tiered network formed in the governance of the Tanjung Binerean Wildlife Corridor. This synergy is seen in several aspects:

a. Strengthening Adaptive Capacity

The role of the district government as a bridging organization strengthens the adaptive capacity generated from multilevel networks. Through facilitating dialogue and coordination, the district government helps translate knowledge and experience from different levels of the network into collective learning and strategic adaptation. Head of Rural Development Division of Bappeda Regency explained:

"Our position as a hub allows us to gather information from a variety of sources – local experiences, WCS research, BKSDA programs – and integrate it to refine our approach. When conditions change on the ground, such as shifts in wildlife migration routes or the emergence of new threats, our network enables rapid response and strategy adjustments." (Interview, May 22, 2023)

This adaptive capacity is also evident in the ability of collaborative forums to learn from failures and adjust approaches based on monitoring and evaluation results.

b. Efficiency of Resource Mobilization

Synergy is also seen in the efficiency of resource mobilization, where the role of bridging organizations helps optimize the allocation of available resources in a multilevel network. District governments help identify gaps and overlaps in resource allocation, and facilitate more efficient redistribution. CSR Manager of PT. J-Resources Bolaang Mongondow explained:

"Through the collaboration forum coordinated by the District Government, we can align our CSR programs with government and NGO programs. This prevents duplication and ensures our resources are used to fill gaps. For example, when BKSDA focuses on habitat protection, we complement it with economic empowerment programs for the surrounding community." (Interview, May 25, 2023)

This efficiency is also strengthened by the existence of a shared information system that allows transparent monitoring of resource allocation.

c. Legitimacy and Equality in Networks

The role of bridging organizations also strengthens legitimacy and equality in multilevel networks. District governments help bridge power gaps and ensure that local

actors' voices are heard in decision-making processes. The head of the farmer group from North Mataindo Village stated:

"With the District Government as a liaison, we feel more heard by the central government and international partners. They help translate our needs and knowledge into language that policymakers understand. This makes us feel that our experiences and views are valued in the area management process."

This increase in legitimacy and equality contributes to strengthening trust between the various actors in the network, which is an important foundation for effective collaboration. Based on the analysis of bridging organization and multilevel networks, this study proposes an adaptive governance model for the management of Tanjung Binerean Wildlife Corridor. This model illustrates the integration between the function of bridging organization and multilevel network structure in an adaptive cycle (Figure 1).

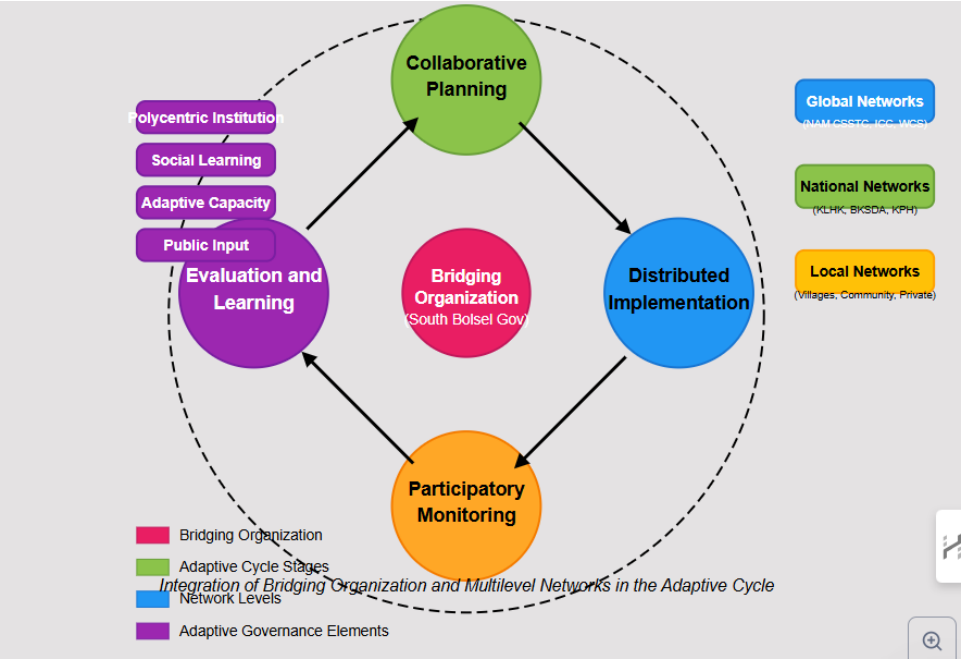

Figure 1: Adaptive Governance Model of Tanjung Binerean Wildlife Corridor.

This model includes four main components:

a. Collaborative Planning

At the planning stage, the district government as a bridging organization facilitates a collaborative planning process involving actors from various levels of the network. This process integrates scientific knowledge, formal policies, and local knowledge to produce an adaptive action plan. The Head of Bappeda Regency explained this process:

"In developing the area management plan, we apply the principle of bottom-up planning combined with top-down policy direction. We start by gathering input from

the village community, then integrating it with the policy framework from the Ministry of Environment and Forestry and international standards brought by partners such as WCS. The collaboration forum is a place to discuss and align these inputs." (Interview, May 30, 2023)

This collaborative planning produces a flexible area management plan document that can be adjusted based on monitoring and evaluation results.

b. Distributed Implementation

At the implementation stage, this model proposes a distributed implementation approach where responsibilities are distributed to various levels of the network according to their respective capacities and competencies. The district government as a bridging organization plays a role in coordinating and facilitating implementation. The Head of the North Sulawesi BKSDA explained:

"We implement a clear division of roles in program implementation. BKSDA focuses on aspects of wildlife protection and core habitat, KPH manages production forest areas around the corridor, the district government coordinates community empowerment programs, and local communities are involved in monitoring and land rehabilitation. This division ensures effective implementation by utilizing the strengths of each party." (Interview, June 2, 2023)

This distributed implementation is supported by an effective communication system to ensure coordination and consistency of actions.

c. Participatory Monitoring

The third component in the model is participatory monitoring, where various actors at all levels of the network are involved in monitoring the condition of the area and the effectiveness of interventions. The district government as a bridging organization facilitates the integration of monitoring data from various sources. WCS Indonesia Monitoring Coordinator explains this system:

"We developed a monitoring system that combines technology such as camera traps and GPS with local community knowledge. Communities around the corridor are involved as volunteer monitors who report illegal activities or the presence of animals using a smartphone application. This data is then integrated with data from official BKSDA patrols and scientific observations by the research team. The result is a comprehensive picture of the condition of the area that is updated regularly." (Interview, June 5, 2023)

This participatory monitoring system not only produces up-to-date data on the condition of the area, but also strengthens local communities' sense of ownership of the conservation process.

d. Evaluation and Reflective Learning

The final component in the model is evaluation and reflective learning, where monitoring results are analyzed together to generate learning and strategy adjustments. The district government as a bridging organization facilitates this collective reflection process. The Secretary of the Collaboration Forum explained:

"Every six months, we hold a review meeting involving all forum members. We reflect on what worked, what didn't work, and the lessons learned. Based on this reflection, we adjust our plans and approaches for the next period. This process allows us to continuously learn and adapt, rather than just rigidly executing the plan." (Interview, June 8, 2023)

This reflective learning process serves as a bridge that connects the governance cycle and ensures continuous adaptation based on changing experiences and conditions.

E. Implications for Landscape-Based Conservation Governance

The results of the study on the integration of bridging organizations and multilevel networks in the governance of the Tanjung Binerean Wildlife Corridor have several important implications for landscape-based conservation governance more broadly:

a. Policy and Regulatory Reform

This study reveals the need for policy and regulatory reform to strengthen the role of district governments as bridging organizations in biodiversity conservation. In particular, there is a need to review the division of authority and funding structures regulated in Law No. 23 of 2014 on Regional Government.The District Regional Secretary explained:

"Our experience shows that despite the long-standing decentralization policy, there are still gaps in terms of authority and funding for conservation at the district level. We hope that there will be a revision of the policy that provides clearer authority and budget to district governments in managing conservation areas in their regions, especially for areas with high biodiversity value outside formal conservation areas." (Interview, June 10, 2023)

Policy reforms also need to include formal recognition of collaborative and adaptive governance models in conservation-related legislation.

b. Strengthening Local Institutional Capacity

Another implication is the importance of strengthening local institutional capacity, both for district governments as bridging organizations and other local institutions that act as nodes in multi-level networks.WCS Indonesia Regional Director explains:

"Experience in Tanjung Binerean shows that the effectiveness of governance is highly dependent on the capacity of local institutions. Long-term investment is needed in developing the capacity of district governments and community institutions to play their roles in governance networks. This includes improving technical knowledge, facilitation skills, and adaptive management capabilities." (Interview, June 12, 2023)

Capacity building programs need to be designed comprehensively, covering technical, managerial, and socio-political aspects in managing conservation areas.

c. Integration of Conservation and Development

This study also emphasizes the importance of integration between biodiversity conservation and local economic development in an adaptive governance approach. The Head of the District Agriculture Service explained:

"Our experience shows that conservation will only be successful if the local community sees tangible benefits from conservation efforts. In Tanjung Binerean, we have developed an agroforestry and ecotourism model that integrates habitat protection with local economic development. This approach not only reduces pressure on the conservation area but also builds community support for long-term conservation." (Interview, June 15, 2023)

This integration needs to be supported by coherent policies and programs from various sectors, as well as appropriate incentive mechanisms to encourage sustainable practices.

3.2. Discussion

The research findings on the role of bridging organizations and multilevel networks in the adaptive governance of the Tanjung Binerean Wildlife Corridor have a strong fit with several theoretical frameworks in the adaptive governance literature. The results of the study indicate that the Bolaang Mongondow Selatan Regency Government has played an effective role as a bridging organization despite facing limited authority and budget, in line with the argument of [23] that bridging organizations are crucial in connecting actors at various levels and facilitating knowledge exchange and building trust.

The district government's ability to mobilize resources from various stakeholders confirms the findings of [6] on the function of bridging organizations in reducing transaction costs and mediating power asymmetries. This can be seen from the success of the Bolsel District Government in integrating support from the BKSDA, WCS Indonesia, and the private sector despite facing budget constraints. However, the challenges related to legitimacy and sustainability found in this study also underscore [24] argument that bridging organizations require strong policy and institutional support for long-term effectiveness.

The multilevel network structure identified in this study exhibits characteristics consistent with[25] concept of type II multilevel governance, where governance networks are functional and transcend administrative boundaries. The finding that multilevel networks contribute to increased adaptive capacity through diversification of approaches and resources confirms [26]proposition on the relationship between institutional diversity and the resilience of social-ecological systems.

The patterns of information flow and power distribution in multilevel networks revealed in this study reflect analysis of the influence of network structure on conservation outcomes. The existence of power asymmetries that tend to favor national and global actors.

The proposed adaptive governance model based on the integration of [9] which emphasizes the interaction between legal frameworks, institutional arrangements, and adaptive capacity in governance resilience. This finding also strengthens the argument of [27] that adaptive governance emerges through the dynamic interaction of various components, including polycentric institutions, social learning, and multi-level networks.

4. Conclusion

The research on Tanjung Binerean Wildlife Corridor governance reveals the Bolaang Mongondow Selatan Regency Government's effective role as a bridging organization despite authority and budget constraints, facilitating essential coordination and cooperation among stakeholders through established multilevel networks connecting local, national, and global actors that enhance adaptive capacity, resource diversification, and knowledge exchange despite power asymmetry challenges; the integration of these bridging functions with multilevel network structures forms the foundation for an adaptive governance model enabling continuous learning and adjustment through

collaborative planning, distributed implementation, participatory monitoring, and reflective learning processes; policy recommendations include conservation decentralization reforms, strengthening bridging organizational capacities, optimizing multilevel networks through digital platforms and inclusive mechanisms, and better integrating conservation with sustainable development initiatives such as ecosystem service payment systems and spatial planning integration; the study proposes further research on long-term governance impact assessment, comparative bridging organization analysis across various socio-ecological contexts, development of network effectiveness metrics, investigation of political-economic influences on governance sustainability, and exploration of information technology's role in strengthening institutional connections, ultimately demonstrating that despite challenges, the integration of bridging organizations with multilevel networks provides a robust foundation for adaptive landscape-based conservation governance.

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